



ISCC Plus 인증을 통한 비즈니스 성공사례와 과제

한국바스프 박준영 매니저 | 2024.01.23
Operation Strategy & Site Support Team

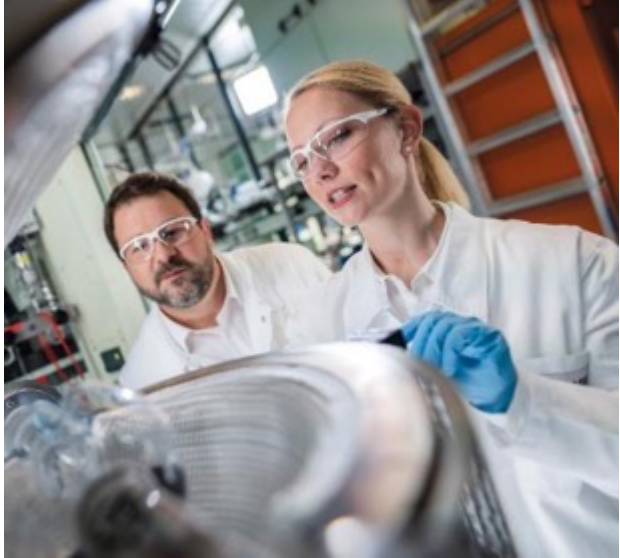
BASF at a glance



**Our chemistry
is used in almost
all industries**



**Sales in 2022
€87.3 billion**



**We combine
economic success,
social responsibility
and environmental
protection.**



**6 Verbund sites
and 239 other
production
sites in the
world**

Korea



8 production sites*



1,221 employees**



~ €1.5 billion sales*** in 2022

*	Site number as of December 31, 2022
**	Employee number as of December 31, 2022
***	By location of customer as of December 31, 2022

All figures refer to BASF entities fully consolidated according to IFRS 10/11.





BASF as thought and action leader leads the transformation towards a sustainable future



The challenge of climate protection

- Continued emission of greenhouse gases will cause **further warming and long-lasting changes** in all components of the climate system.
- **Limiting global warming** requires a significant **reduction of global greenhouse gas emissions**.
- **All options have to be considered** to limit warming to well below 2°C , if not 1.5°C above pre-industrial levels, e.g. improvement of energy efficiency, renewable energy sources.
- The implementation of respective measures involves **substantial technological, economic, social and institutional challenges**.



Climate protection is a global joint task.

Source: IPCC, 5th Assessment Report, Synthesis Report, 2014;
Paris climate conference (COP21) in December 2015.

The extended BASF climate targets now encompass a larger part of the value chain

2030

25%

Scope 1 and **Scope 2**

CO₂ emission reduction
(compared with 2018)

15%

specific **Scope 3.1**

CO₂ emission reduction
(compared with 2022)¹

2050

net zero

Scope 1, **Scope 2**

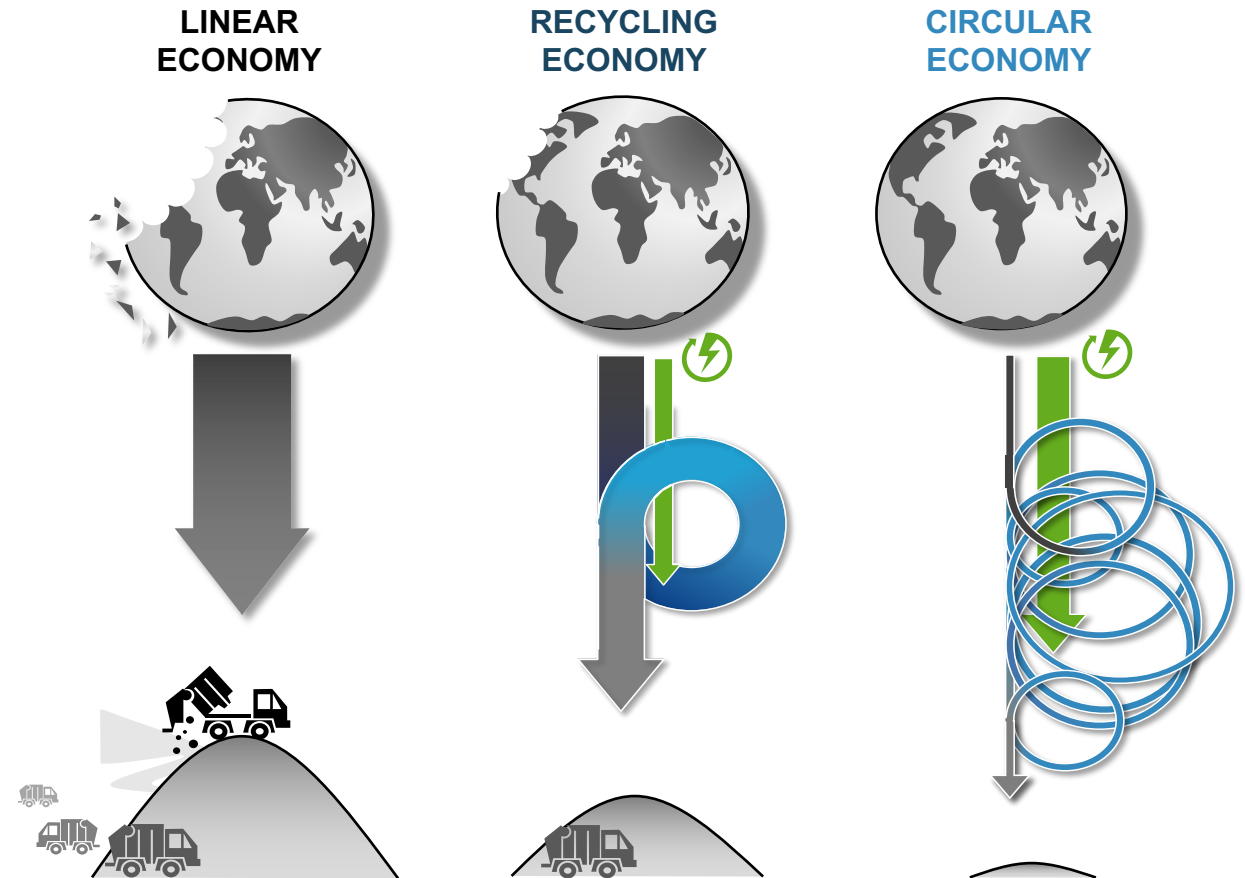
and **Scope 3.1**

CO₂ emissions

¹ Corresponds to a reduction from 1.57 to 1.34 kilograms of CO₂e per kilogram of raw material bought; calculated on the basis of relevant Scope 3.1 emissions of 48 million metric tons

A Circular Economy is one of the keys to drive climate neutrality decoupling growth from resource consumption

- **Rethink design** and use of resources and **keep** them in **use as long as possible**, close and extend material loops
- **Recover and recycle** products and materials
- **Avoid waste** and **pollution** and **protect natural systems**



Mass balance is one way of using alternative raw materials to manufacture products in a more sustainable way

Recycled feedstock

Renewable feedstock

Mass balance approach

Chemical recycling (e.g. ChemCycling®)



Pyrolysis oil derived from plastic waste or end-of-life tires

Biomass balance (BMB)



Biomethane or bio-naphtha derived from biomass

Dedicated mechanical recycling



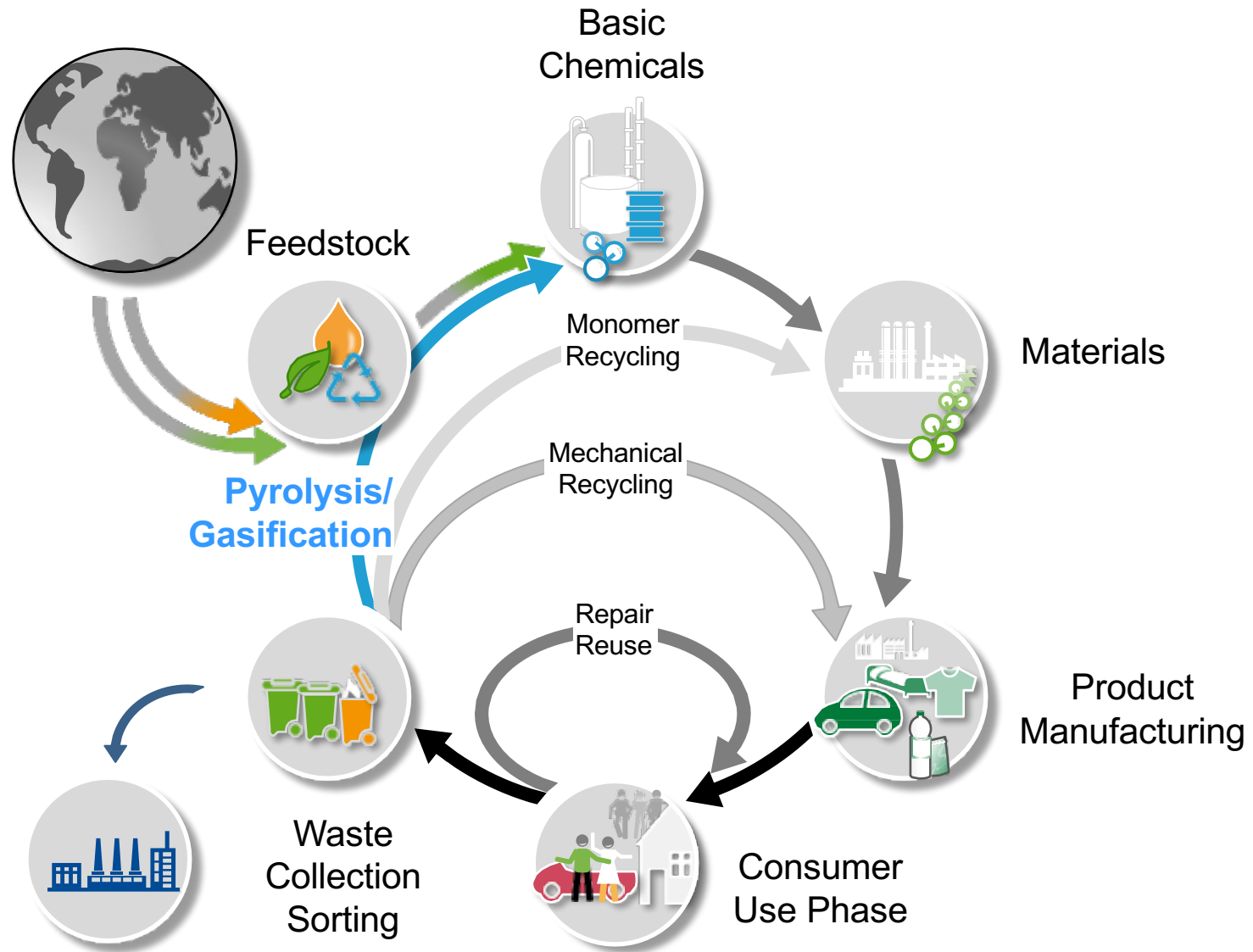
Mechanically recycled feedstock derived e.g., from waste polystyrene (PS)

Dedicated bio-based production



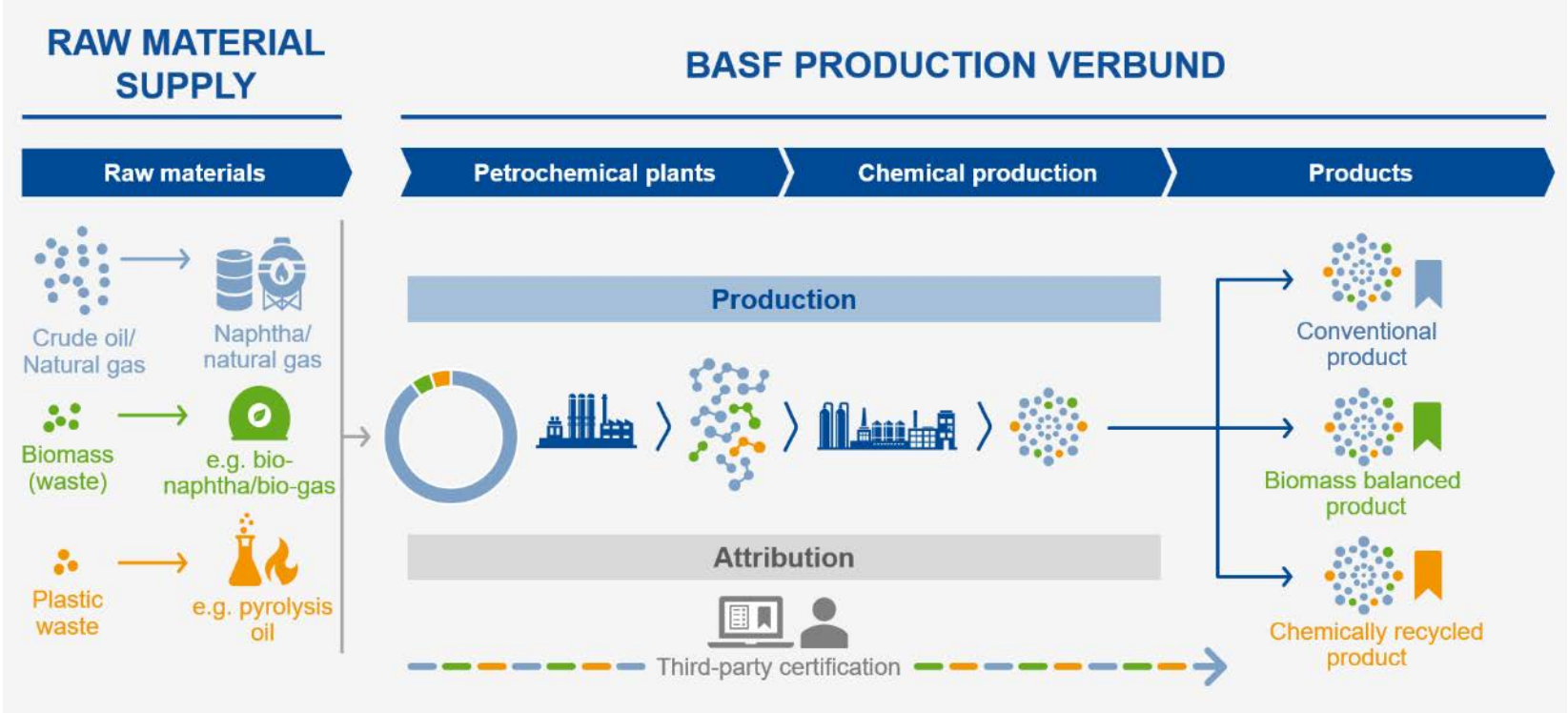
Carefully sourced bio-based resources, e.g., certified sustainable castor oil

Net zero CO₂ emissions in a Circular Economy



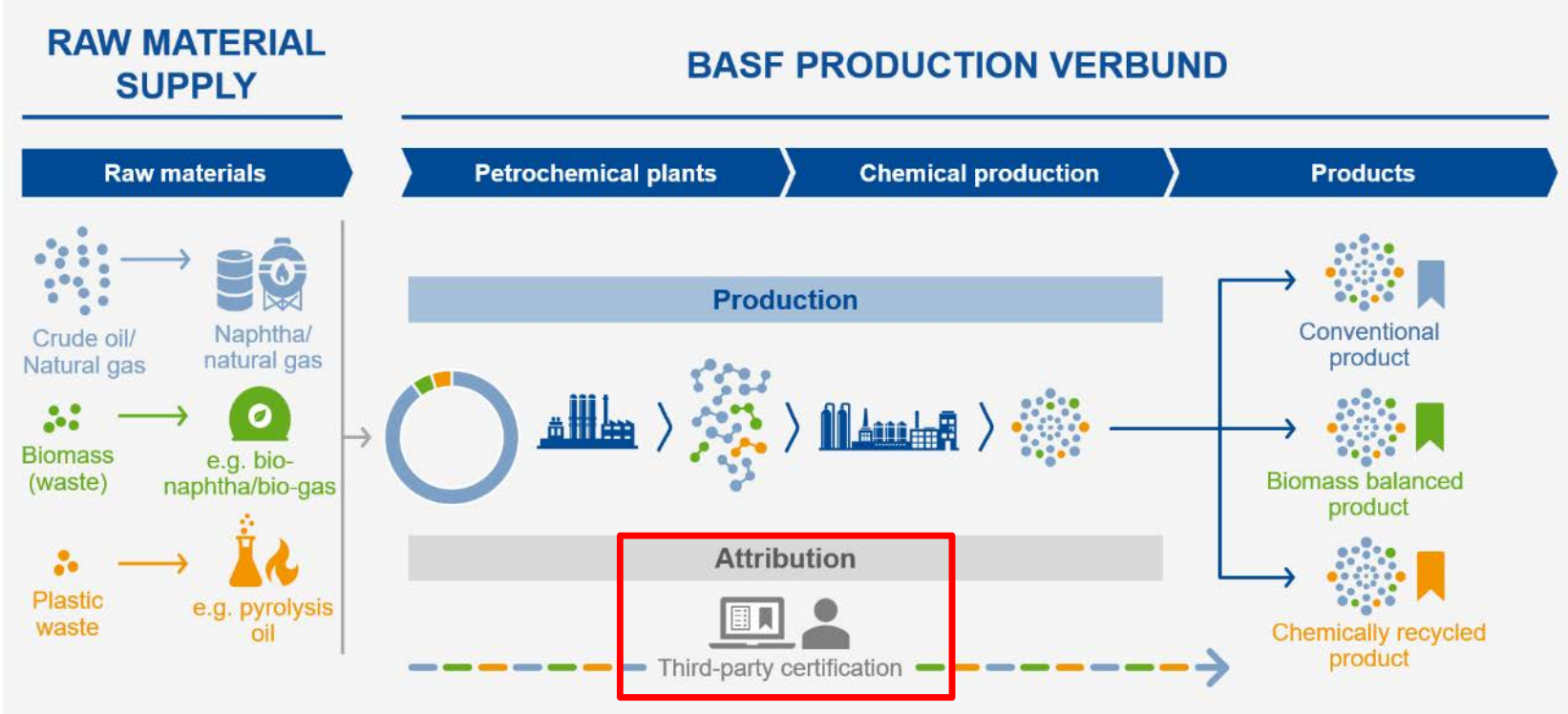
Mass Balance approach enables the replacement of fossil feedstock, and the transition to circular and low PCF/ net-zero products

An open loop Mass Balance approach is the strongest driver to replace fossil feedstock and accelerate the use of circular feedstock



→ Mass Balance approach applies to renewable and recycling based feedstock

Mass Balance approach enables the replacement of fossil feedstock, and the transition to circular and low PCF/ net-zero products

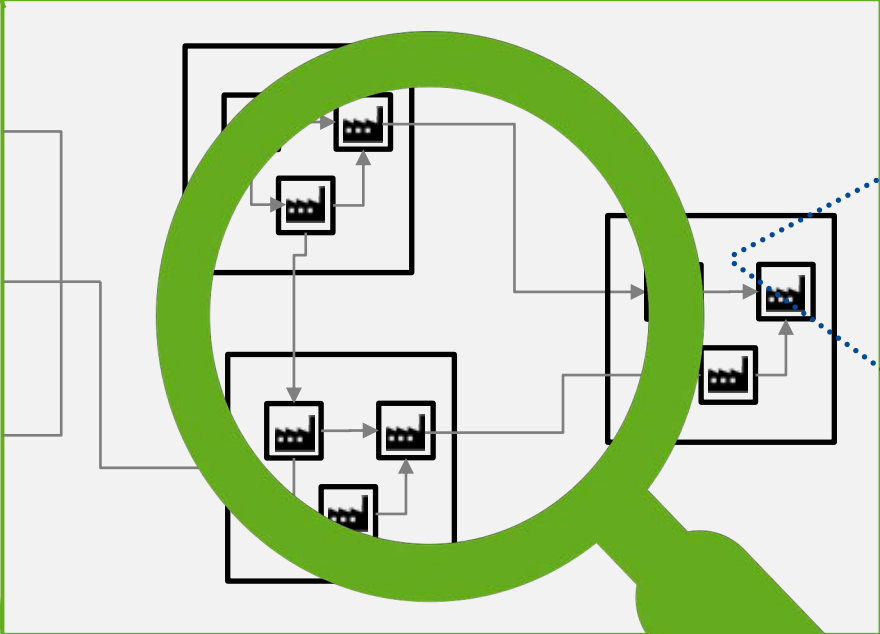


→ Mass Balance approach applies to renewable and recycling based feedstock

Third party audits following the rules of accepted certification standards schemes are crucial for the credibility of mass balance



Production network



Key aspects of the audits at the producer

Input yield and conversion factors:
How much alternative feedstock is needed to produce 1 ton of the to be certified product?

Booking period:
Has this amount of alternative feedstock been booked to the certified product within the balancing period?

Feedstock sustainability:
Do the alternative raw materials fulfill the scheme's sustainability criteria?

Scope for audit:
Includes products, production sites including warehouses and tollers

Key benefits of the Mass Balance Approach in the transition to circular feedstock for the chemical industry



Environmental benefit

Replacement of fossil feedstock

Potential for **reduced CO₂ emissions**

Potential for **increased circularity of feedstock**

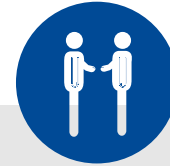
Complementarity to all other methods



Fast transition

Immediate effect by using existing production assets

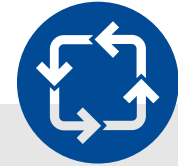
Scalable from small to large volumes



Direct customer support

Drop-in solution: Unchanged product quality allows fast transition throughout the value chain

Transparency of feedstock replacement by certification



Circular product choices drive change

Uncompromised **product safety** and quality of established consumer products

Affordable products that contribute to the replacement of fossil resources

Certified Mass balanced product portfolio helps to save fossil resources and reduces carbon emissions

- **More than 1,000 biomass balanced (BMB) products** and **more than 200 Ccycled® products** are already certified
- The **correct attribution of renewable/recycled feedstocks** in BASF's value chains is ensured via certification according to known certification standard schemes
- **Reduced product carbon footprint** compared to conventional grades according to life cycle assessment



BASF mass balanced products requested in all industries

Biomass balanced (BMB)

Replacing fossil feedstock with Renewable feedstock

Consumer Home Care

Customer substitutes fossil carbon feedstock in home/beauty care products

Aroma Ingredient Geraniol Extra BMBcert™ with certified low carbon footprint

Construction

Neopor® BMB: EPS for building and construction

Elastopir®: PU for sandwich panels

Electronical Application

Fossil-saving plastic Ultraform® BMB for electronical applications

Automotive

Door handle from mass balanced Ultramid® in a combination of biomass balance and ChemCycling®



BASF mass balanced products requested in all industries

Ccycled®
Replacing fossil feedstock with Recycled feedstock

Textile
Outdoor gear with Ultramid® Ccycled®

Food Packaging
Multilayer food packaging

Sustainable packaging for shelf-life extension of fresh produce with Ultramid® Ccycled®

Packaging
Pharma boxes made of Styropor Ccycled® for transport of temperature-sensitive goods

Automotive
Door handle from mass balanced Ultramid® in a combination of biomass balance and ChemCycling®



ISCC Plus certified sites and products of BASF globally



1) Number of ISCC Plus certified sites as of January 2024
 2) Number of ISCC Plus certified products as of January 2024
 3) Numbers excl. products from Gimcheon, Ansan site

BASF in Korea driving low-PCF portfolio transformation

- Value chains in Korea (MDI¹, TDI², PA66³) to produce ISCC+ BMB Products and ready to supply to customers
- Supporting BASF's goal to provide sustainable solutions to the customers in the region

March
2023



Onsan and Yeosu site first achieved ISCC+ certification in APAC monomer division for adipic acid, PA66, MDI and TDI

September
2023



Yeosu site 1st production of BMB MDI certified by ISCC+

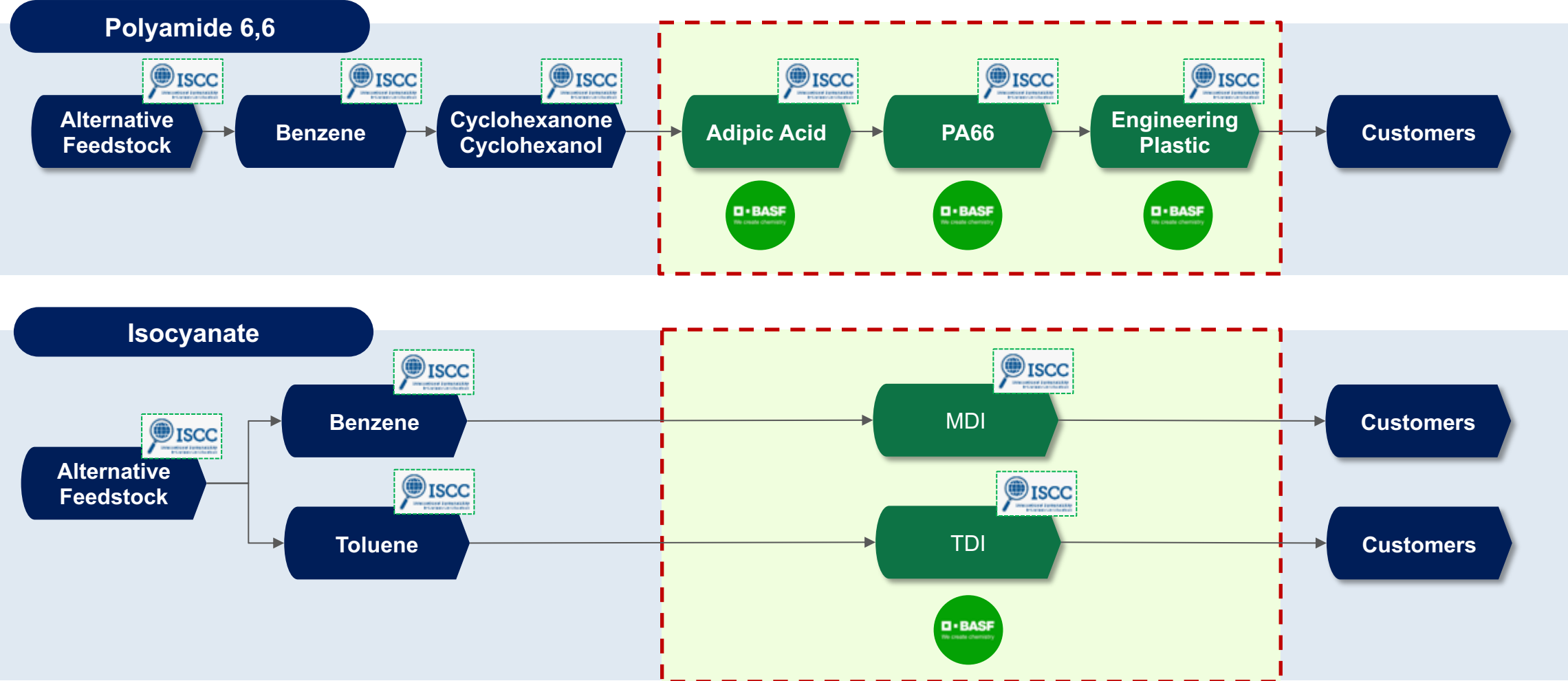
November
2023



Yeosu site 1st production of BMB TDI certified by ISCC+

1) MDI: Methylene diphenyl diisocyanate
2) TDI: Tolulene diisocyanates
3) PA66: Polyamide 6,6

ISCC Plus Certification covers BASF's production in Korea



Legislation and customers are pushing for recyclability

Legislation (examples)

Europe

- Packaging and packaging waste regulation (in place)
- End-of-life vehicle directive (under finalization) enforces recycled content to originate from automotive plastics

China

- Target for textile recycling (announced)

United Nations

- Plastic recyclability will be a key discussion topic of the Plastics treaty (in preparation)

→ **Recyclability becoming a global legal requirement**

Brand owners (examples)



- Phase-out of materials considered as non-recyclable such as PU foam

INDITEX



- Joint investment in chemical textile-to-textile recycling
- Target of 95% of material recyclability



- Target of > 95% material recyclability in appliances

→ **Recyclability becoming a relevant buying factor**

On the way to a circular economy, we are tackling several challenges

Collaboration

Cross value chain collaboration for **new partnerships**



Mindset

Shift **mindset** from “take – make – dispose” to circular models



Technological

Development of **recycling techniques** and insuring **purity of materials** to be recycled



Certification / Regulations

Use of accepted claims, etc.



Waste as Raw Materials

Sourcing **waste with suitable quality, price and volume** and **overcoming regulatory challenges**



Infrastructure

Develop suitable **systems** for end-of-life waste streams



Let's join forces to turn challenges into opportunities and enable a transition towards circular economy with more sustainable plastics



Mindset shift to circular models and scientific discussions



Cross value chain collaboration for solutions and standards



Support global and national certifications and regulations



National open loop setup and acceptance of mass balance



Global EPR schemes and CO2 pricing mechanisms



Infrastructure and access to suitable waste streams



We create chemistry